Playa Emissivity Estimation

March 14, 2006

1

MacDougall Method

- **Categorize Exposed Playa**
  - Sand
  - Clay
  - Cemented
- **Define Land Type Reservoirs**
- **Describe Wind Events**
- **Incorporate Rain Event Effects**
- **Incorporate Humidity Effects**

2

Next Steps

- **One-year Meteorological Data Model Runs**
- **Develop Appropriate Means of Handling Crust Effects**
- **Refine Model Runs with DRI PI-SWERL Results**
- **Final Model Runs for Analysis of Alternatives**

3

One Year Meteorological Data

- **Wind Field Analysis Was Limited Due to the Expanse of the Sea and Available Data**
- **2002 Ten Meter Tower Data for Indio, Westmoreland and Niland was used**
- **The Salton Sea Area was Divided by Location Between the Three Meteorological Data Sets**

4

Owens Lake Wind Tunnel Study

- **Soils**
  - Dune Sand
  - Sand
  - Sand over Clay
  - Clay
  - Silty Clay
  - Silty Clay Cemented
- **Tested With and Without Sand Feed**
- **Surface Crusting Developed During Testing Period**
- **Surface Crust was Factor Most Closely Associated with Emissions "Irrespective of Sub-soil Type"**

5

MacDougall Method Results Using Owens Lake Wind Tunnel Data

- **Only Niland Meteorological Data Had Wind Speeds Above The Thresholds**
- **Soils without Cementing Resulted in Emissions of 174 tons/year**
- **Soils with Cementing Resulted in Emissions of 7.35 tons/year**

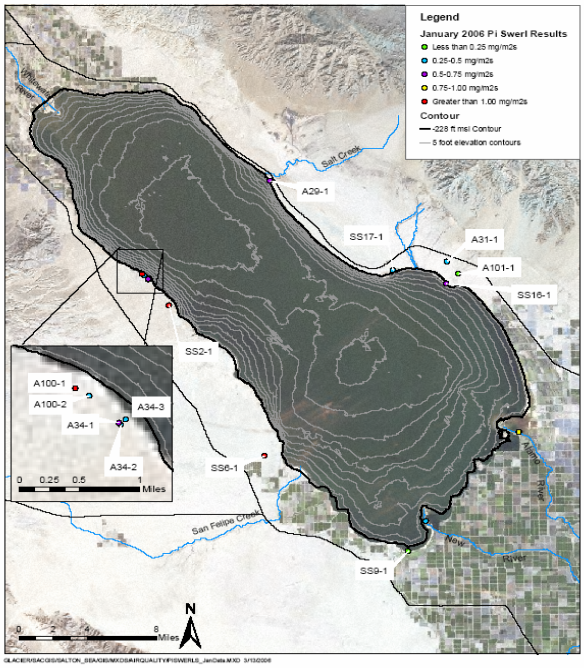
6

Develop Appropriate Means of Handling Crust Effects

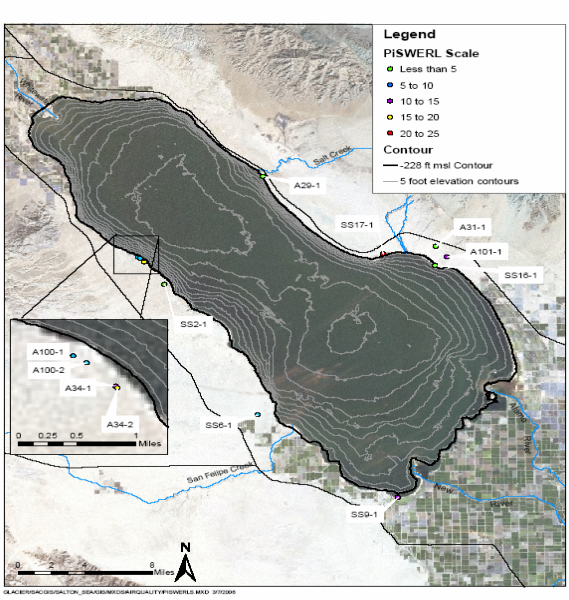
- **Crusts Measured at the Time of the PI-SWERL Testing**
- **Assume September Crusts Would Pass the Ball Drop Test**
- **Assume January Crusts Would Not Pass the Ball Drop Test**

7

8


Legend
January 2006 Pi Swerl Results
Less than 0.25 mg/m2s
0.25-0.5 mg/m2s
0.5-0.75 mg/m2s
0.75-1.00 mg/m2s
Greater than 1.00 mg/m2s
Contour
-228 ft msl Contour
5 foot elevation contours
Salt Creek
A29-1
SS17-1
A31-1
A101-1
SS16-1
SS2-1
A100-1
A100-2
A34-3
A34-1
A34-2
SS6-1
San Felipe Creek
New River
SS9-1
Miles
N

9


Legend
PiSWERL Scale
Less than 5
5 to 10
10 to 15
15 to 20
20 to 25
Contour
-228 ft msl Contour
5 foot elevation contours
Salt Creek
A29-1
SS17-1
A31-1
A101-1
SS16-1
SS2-1
A100-1
A100-2
A34-1
A34-2
SS6-1
San Felipe Creek
New River
SS9-1
Miles
N

10

Handling of Salt Crust

- **Rain**
- **Humidity / Temperatures**
- **Crust Strength**
- **Wind Threshold Velocities**
- **Crust Model Incorporation into Emissions Models**

11

Humidity/Temperature Effects

- **Reviewing Humidity and Temperature Data During the Time Period the January PI-SWERL Testing Was Completed**
- **Develop a Humidity and Temperature Profile Which Will Be an Indicator of When the Salton Sea Playa Will Not Pass the Ball Drop Test**

12

Crust Strength

- **Use the September PI-SWERL Results to Indicate Playa With Sufficient Crust Strength to Pass the Ball Drop Test**
- **Use the January PI-SWERL Results to Indicate Playa Without Sufficient Crust Strength to Pass the Ball Drop Test**

13

Threshold Wind Velocities

- **PI-SWERL Data Does Not Result in Threshold Wind Velocities**
- **Use the Imperial Valley Natural Events Action Plan as a Guideline for Wind Thresholds that Cause Excess Emissions**

14

Crust Model Incorporation

- **Use September and January PI-SWERL Data to Provide Emission Brackets**
- **Use the Temperature and Humidity Data During the January Testing as an Indicator for the Occurrence Frequency of Emissive Playa Conditions**

15